

What is Claimed:

1. A method of suppressing the removal rate of an underlying silicon-containing dielectric layer during the chemical-mechanical polishing of a barrier layer in a damascene structure, said method comprising polishing said barrier layer using a chemical-mechanical polishing slurry comprising an agent that suppresses the rate at which said underlying silicon-containing dielectric layer is removed.
2. The method according to claim 1 wherein said agent that suppresses the rate at which said underlying silicon-containing dielectric layer is removed comprises a compound having at least two functional amino groups (NH_2) and at least one functional carboxylic acid group (COOH).
3. The method according to claim 2 wherein said agent that suppresses the rate at which said underlying silicon-containing dielectric layer is removed is selected from the group consisting of lysine and arginine.
4. The method according to claim 2 wherein said agent that suppresses the rate at which said underlying silicon-containing dielectric layer is removed comprises from about 0.1% to about 5.0% by weight of said slurry.
5. The method according to claim 1 wherein said agent that suppresses the rate at which said underlying silicon-containing dielectric layer is removed comprises a compound having at least two functional amino groups (NH_2) and at least one functional carboxylic acid group (COOH).
6. The method according to claim 5 wherein said agent that suppresses the rate at which said underlying silicon-containing dielectric layer is removed is selected from the group consisting of lysine and arginine.
7. The method according to claim 5 wherein said agent that suppresses the rate at which said underlying silicon-containing dielectric layer is removed comprises by weight from about 0.1% to about 5.0% of said slurry.
8. The method according to claim 5 wherein said barrier layer comprises tantalum and/or tantalum nitride.
9. The method according to claim 8 wherein the pH of said slurry is about 7.0 or higher.

10. The method according to claim 5 wherein said barrier layer comprises titanium and/or titanium nitride.

11. The method according to claim 10 wherein the pH of said slurry is about 7.0 or lower.

12. The method according to claim 5 further comprising abrasive particles.

13. The method according to claim 12 wherein said abrasive particles are selected from the group consisting of alumina, ceria, copper oxide, diamond, iron oxide, nickel oxide, manganese oxide, silica, silicon carbide, silicon nitride, tin oxide, titania, titanium carbide, tungsten oxide, yttria, and zirconia.

14. The method according to claim 2 wherein said chemical-mechanical polishing slurry further comprising an oxidizing agent.

15. The method according to claim 14 wherein said oxidizing agent is selected from the group consisting of peroxides, persulfates, peroxydiphosphates, ferric nitrate, periodic acid, and periodates.

16. The method of claim 1 wherein said chemical-mechanical polishing slurry further comprises a solvent.

17. The method according to claim 16 wherein said solvent comprises deionized water.

18. The method according to claim 1 wherein said underlying silicon-containing dielectric layer is selected from the group consisting of polysilicon, single-crystalline silicon, silicon dioxide, silicon-containing low-k inorganic and organic materials, phosphosilicate glass, and borophosphosilicate glass.